

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Charles J. JACOBUS et al.                      Examiner:    To Be Assigned  
Application No.:        To Be Assigned                                      Art Unit:        To Be Assigned  
Filed:                      Herewith  
For:                        FORCE FEEDBACK SYSTEM AND ACTUATOR  
                                 POWER MANAGEMENT

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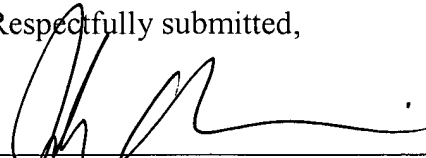
**INFORMATION DISCLOSURE STATEMENT**

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, Applicants submit herewith on Form PTO-1449 and 892 a listing of documents known to the Applicants and/or their attorney. Applicants respectfully request consideration of the cited documents and making the same of record in the prosecution of the above-identified application. In so doing, Applicants do not waive any rights to take appropriate action to establish patentability over the listed documents should they be applied as references against the claims of the present application.

This Information Disclosure Statement is being submitted with the application, and, therefore, no certification or fee is required (37 C.F.R. § 1.97b(1)). However, should any fees be due, the Commissioner is authorized to charge such fees to Deposit Account No. 16-1435. A duplicate of this sheet is attached for that purpose.

Respectfully submitted,

Date: 2/27/04

  
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John C. Alemanni (Reg. No. 47,384)  
Attorney for Applicant

KILPATRICK STOCKTON LLP  
1001 West Fourth Street  
Winston-Salem, NC 27101  
(336) 607-7311 (voice)  
(336) 734-2621 (fax)

51851-282042  
WINLIB01:1060237.1

**Notice of References Cited**

Application/Control No.

09/638,485

Applicant(s)/Patent Under  
Reexamination  
JACOBUS ET AL.

Examiner

Paul Ip

Art Unit

2837

Page 1 of 3

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| *                                   |   | DOCUMENT NO. | DATE      | NAME             | CLASS | SUBCLASS | DOCUMENT SOURCE **       |                          |
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| <input checked="" type="checkbox"/> | B | 5,331,264    | Jul. 1994 | Cheng et al.     | 318   | 568.11   | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | C | 5,130,404    | Apr. 1992 | McIntosh         | 318   | 568.22   | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | D | 5,049,796    | Sep. 1991 | Seraji           | 318   | 568.1    | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | E | 4,913,000    | Apr. 1990 | Wyllie           | 74    | 523      | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | F | 4,893,981    | Jan. 1990 | Yoshinada et al. | 414   | 5        | <input type="checkbox"/> | <input type="checkbox"/> |
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| <input checked="" type="checkbox"/> | J | 4,837,734    | Jun. 1989 | Ichikawa et al.  | 364   | 513      | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | K | 4,795,296    | Jan. 1989 | Jau              | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | L | 4,680,519    | Jul. 1987 | Chand et al.     | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | M | 4,661,032    | Apr. 1987 | Arai             | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |

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Notice of References Cited

Part of Paper No. 3

|                                   |                         |   |             |
|-----------------------------------|-------------------------|---|-------------|
| <b>Notice of References Cited</b> | Application/Control No. | Applicant(s)/Patent Under Reexamination |             |
|                                   | 09/638,485              | JACOBUS ET AL.                          |             |
|                                   | Examiner                | Art Unit                                | Page 2 of 3 |
|                                   | Paul Ip                 | 2837                                    |             |

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| <input checked="" type="checkbox"/> | B | 4,604,016    | Aug. 1986 | Joyce            | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
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| <input checked="" type="checkbox"/> | D | 4,531,080    | Jul. 1985 | Nordstrom et al. | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | E | 4,521,685    | Jun. 1985 | Rebman           | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | F | 4,511,985    | Apr. 1985 | Inaba et al.     | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | G | 4,510,574    | Apr. 1985 | Guittet et al.   | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | H | 4,459,870    | Jul. 1984 | Gill et al.      | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | I | 4,420,808    | Dec. 1983 | Diamond et al.   | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | J | 4,367,532    | Jan. 1983 | Crum et al.      | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | K | 4,348,142    | Sep. 1982 | Figour           | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | L | 4,302,138    | Nov. 1981 | Zarudiansky      | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | M | 4,206,319    | Apr. 1981 | Motoda et al.    | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |

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Notice of References Cited

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|                                   | 09/638,485              | JACOBUS ET AL.                          |             |
|                                   | Examiner                | Art Unit                                | Page 3 of 3 |
|                                   | Paul Ip                 | 2837                                    |             |

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| <input checked="" type="checkbox"/> | F | 3,948,093    | Apr. 1976 | Folchi et al.      | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | G | 3,920,972    | Nov. 1975 | Corwin, Jr. et al. | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | H | 3,620,095    | Nov. 1971 | Dane               | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | I | 3,618,786    | Nov. 1971 | Fick               | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | J | 3,561,263    | Feb. 1971 | Ward               | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |
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| <input checked="" type="checkbox"/> | M | 3,409,252    | Nov. 1968 | Miller             | --    | --       | <input type="checkbox"/> | <input type="checkbox"/> |

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**SUPPLEMENTAL  
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Sheet 1 of 1

**Complete if Known**

|                        |                     |
|------------------------|---------------------|
| Application Number     | 09/638,485          |
| Filing Date            | August 14, 2000     |
| First Named Inventor   | JACOBUS, Charles J. |
| Art Unit               | 2837                |
| Examiner Name          | SMITH, Tyrone W.    |
| Attorney Docket Number | IMM069D             |

**U.S. PATENT DOCUMENTS**

| Examiner | Cite No. <sup>1</sup> | Document Number<br>Number Kind Code <sup>2</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|----------|-----------------------|---|--------------------------------|--|---|
|          | 1                     | 6,219,034   | 4/17/01                        | Elbing, et al.                                     |   |

| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Foreign Patent Document   |                     |                                   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited<br>Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear |
|-----------------------|--------------------------|---------------------------|---------------------|-----------------------------------|--------------------------------|---|--|
|                       |                          | Country Code <sup>3</sup> | Number <sup>4</sup> | Kind Code <sup>5</sup> (if known) |                                |   |  |
|                       | 2                        | JP                        | 01-003664           |                                   | 7/19/1990                      | Taito Corporation                                     | ✓  |
|                       | 3                        | JP                        | 02-109714           |                                   | 1/13/1992                      | Epoch Co. and Key-<br>Planning Co.                    | ✓  |
|                       | 4                        | JP                        | 05-193862           |                                   | 1/27/1995                      | Sega Corporation                                      | ✓  |
|                       | 5                        | JP                        | 04-007371           |                                   | 8/3/1993                       | Taito Corporation                                     | ✓  |

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

| Examiner<br>Initials * | Cite<br>No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the<br>item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue<br>number(s), publisher, city and/or country where published. |
|------------------------|--------------------------|---|
|                        | 6                        | SCANNELL, "Taking a Joystick Ride," Computer Currents, Boston Edition, Vol. 9, No. 11, November 1994.   |

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|                                   | Examiner<br>Tyrone W Smith            | Art Unit<br>2837  | Page 1 of 1 |
|                                   |                                       |   |             |

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|   | C | US-4791588                                       | 12-1988         | Onda et al     | 364/513        |
|   | D | US-5155423                                       | 10-1992         | Karlen et al   | 318/568.11     |
|   | E | US-5266875                                       | 11-1993         | Slotine et al  | 318/568.11     |
|   | F | US-  |                 |                |                |
|   | G | US-  |                 |                |                |
|   | H | US-  |                 |                |                |
|   | I | US-  |                 |                |                |
|   | J | US-  |                 |                |                |
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Sheet 1 of 5

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| First Named Inventor   | Charles J. JACOBUS |
| Group Art Unit         | 2837               |
| Examiner Name          | Tyrone W. Smith    |
| Attorney Docket Number | IMM069D            |

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|----------|-----------------------|--|--------------------------------|--|---|
|          |                       | Number Kind Code <sup>2</sup> (if known) |                                |  |   |
|          | AA                    | 3,220,121                                | 11/30/1965                     | Cutler   |   |
|          | AB                    | 3,517,446                                | 6/30/1970                      | Coryon et al.                                      |   |
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|          | AF                    | 4,599,070                                | 7/8/1986                       | Hladky et al.                                      |   |
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|          | AH                    | 4,713,007                                | 12/15/1987                     | Alban  |   |
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|          | AR                    | 3,902,687                                | 6/25/1973                      | Hightower  |   |
|          | AS                    | 4,160,508                                | 7/10/1979                      | Salsbury   |   |
|          | AT                    | 4,581,491                                | 4/8/1986                       | Boothroyd  |   |
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|          | AX                    | 5,038,089                                | 8/6/1991                       | Szakaly  |   |
|          | AY                    | 5,078,152                                | 1/7/1992                       | Bond   |   |
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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet 2 of 5

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|                        |                    |
|------------------------|--------------------|
| Application Number     | 09/638,485         |
| Filing Date            | August 14, 2000    |
| First Named Inventor   | Charles J. JACOBUS |
| Group Art Unit         | 2837               |
| Examiner Name          | Tyrone W. Smith    |
| Attorney Docket Number | IMM069D            |

| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Foreign Patent Document   |                     |                                   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited<br>Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear |
|-----------------------|--------------------------|---------------------------|---------------------|-----------------------------------|--------------------------------|---|--|
|                       |                          | Country Code <sup>2</sup> | Number <sup>4</sup> | Kind Code <sup>5</sup> (if known) |                                |   |  |
|                       | BI                       | EP                        | EP0349086           |                                   | 1/31/1990                      | Visser  |  |

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|------------------------|--------------------------|---|--|
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| Attorney Docket Number | IMM069D            |

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|                     | CC                    | MCAFFEE, "Teleoperator Subsystem/Telerobot Demonsdtrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1-50, A1-A36, B1-B5, C1-C36, January 1988.  |
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|------------------------|--------------------------|--|--|
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|                        | CW                       | KACZMAREK et al., "Tactile Displays," Virtual Environment Technologies.  |  |

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|  | IMM1P069D        | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

## U.S. Patent Documents

| Examiner Initial | No. | Patent No. | Date     | Patentee        | Class | Sub-class | Filing Date |
|------------------|-----|------------|----------|-----------------|-------|-----------|-------------|
|                  | A   | 4,937,685  | 6/26/90  | Barker et al.   | 360   | 14.1      | 12/2/83     |
|                  | B   | 4,964,004  | 10/16/90 | Barker          | 360   | 14.1      | 6/16/89     |
|                  | C   | 4,998,901  | 1/8/91   | Lehmer          | 318   | 685       | 4/21/89     |
|                  | D   | 5,076,517  | 12/31/91 | Ferranti et al. | 244   | 228       | 8/14/89     |
|                  | E   | 5,184,319  | 2/2/93   | Kramer          | 364   | 806       | 2/2/90      |
|                  | F   | 5,286,203  | 2/15/94  | Fuller et al.   | 434   | 45        | 10/7/92     |
|                  | G   | 5,354,162  | 10/11/94 | Burdea et al.   | 414   | 5         | 8/31/92     |
|                  | H   | 5,428,748  | 6/27/95  | Davidson et al. | 395   | 275       | 9/24/92     |
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|                  | K   | 5,781,172  | 7/14/98  | Engel et al.    | 345   | 164       | 6/16/97     |

## Foreign Patent or Published Foreign Patent Application

| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   | 0085518      | 10.08.83         | EPO                      |       |           | X           |    |
|                  | M   | 0111992      | 27.06.84         | EPO                      |       |           | X           |    |
|                  | N   | 0349086      | 03.01.90         | EPO                      |       |           | X           |    |
|                  | O   | 2235310      | 27.02.91         | GB                       |       |           | X           |    |
|                  | P   | 0326439      | 2.8.89           | EPO                      |       |           |             |    |

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| Examiner Initial | No. | Author, Title, Date, Place (e.g. Journal) of Publication       |
|------------------|-----|--|
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|                  | S   |  |
|                  | T   |  |
| Examiner         |     | Date Considered  |

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|                  | B   | 6,088,017  | 7/11/00 | Tremblay et al.  | 345   | 156       | 4/24/98     |
|                  | C   |            |         |                  |       |           |             |
|                  | D   |            |         |                  |       |           |             |
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|                  | F   |            |         |                  |       |           |             |
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|                  | L   | 95/20788     | 3.8.95           | PCT                      |       |           | X           |    |
|                  | M   | 0626634      | 30.11.94         | EPO                      |       |           | X           |    |
|                  | N   | H6-210065    | 2.8.94           | Japan                    |       |           | X           |    |
|                  | O   | H4-92691     | 25.3.92          | Japan                    |       |           | X           |    |
|                  | P   | H5-86387     | 22.11.93         | Japan                    |       |           | X           |    |

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|                  | N   | 92/00559     | 9.1.92           | PCT                      |       |           | X           |    |
|                  | O   | JP4092691    | 25.3.92          | Japan                    |       |           | X           |    |
|                  | P   | JP7024147    | 27.1.95          | Japan                    |       |           | X           |    |

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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM1P069D        | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

**U.S. Patent Documents**

| Examiner Initial | No. | Patent No. | Date | Patentee | Class | Sub-class | Filing Date |
|------------------|-----|------------|------|----------|-------|-----------|-------------|
|                  | A   |            |      |          |       |           |             |
|                  | B   |            |      |          |       |           |             |
|                  | C   |            |      |          |       |           |             |
|                  | D   |            |      |          |       |           |             |
|                  | E   |            |      |          |       |           |             |
|                  | F   |            |      |          |       |           |             |
|                  | G   |            |      |          |       |           |             |
|                  | H   |            |      |          |       |           |             |
|                  | I   |            |      |          |       |           |             |
|                  | J   |            |      |          |       |           |             |
|                  | K   |            |      |          |       |           |             |

**Foreign Patent or Published Foreign Patent Application**

| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   | JP4008381    | 13.1.92          | Japan                    |       |           | X           |    |
|                  | M   |              |                  |                          |       |           |             |    |
|                  | N   |              |                  |                          |       |           |             |    |
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**Other Documents**

| Examiner Initial | No. | Author, Title, Date, Place (e.g. Journal) of Publication |
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| Examiner         |     | Date Considered  |

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Jacobus et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

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|                  | A   | 3,919,691  | 11/11/75 | Noll            | 340   | 172.5     | 5/26/71     |
|                  | B   | 4,436,188  | 03/13/84 | Jones           | 188   | 378       | 11/18/81    |
|                  | C   | 4,603,284  | 7/29/86  | Perzley         | 318   | 568       | 6/5/84      |
|                  | D   | 4,604,016  | 8/5/86   | Joyce           | 414   | 7         | 8/3/83      |
|                  | E   | 4,775,289  | 10/4/88  | Kazerooni       | 414   | 735       | 9/25/87     |
|                  | F   | 4,795,296  | 1/3/89   | Jau             | 414   | 5         | 11/17/86    |
|                  | G   | 4,800,721  | 01/31/89 | Cemenska et al. | 60    | 393       | 2/13/87     |
|                  | H   | 4,861,269  | 8/29/89  | Meenan, Jr.     | 434   | 45        | 03/30/88    |
|                  | I   | 4,925,312  | 5/15/90  | Onaga et al.    | 364   | 513       | 3/21/88     |
|                  | J   | 4,949,119  | 8/14/90  | Moncrief et al. | 364   | 578       | 1/12/89     |
|                  | K   | 5,007,300  | 4/16/91  | Siva            | 74    | 471 XY    | 1/22/90     |

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|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   | WO9532459    | 30 Nov 95        | PCT                      |       |           | X           |    |
|                  | M   |              |                  |                          |       |           |             |    |
|                  | N   |              |                  |                          |       |           |             |    |
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|                  | S   | Schmult, "Application Areas for a Force-Feedback Joystick", Department of Machine Perception Research AT&T Bell Laboratories, Holmdel, New Jersey, DSC-Vol 49, Interfaces ASME 1993.                           |
|                  | T   | Adelstein, et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control Research", Steling Software Aerospace Human Factors Research Division, NASA-Ames, Moffett Field, CA, 1992. |
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|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Jacobus et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

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|                  | A   | 5,044,956  | 09/03/91 | Behensky et al. | 434   | 45        | 1/12/89     |
|                  | B   | 5,065,145  | 11/12/91 | Purcell         | 340   | 706       | 10/6/89     |
|                  | C   | 5,103,404  | 4/7/92   | McIntosh        | 318   | 568.22    | 12/20/89    |
|                  | D   | 5,107,080  | 4/21/92  | Rosen           | 200   | 6A        | 12/1/89     |
|                  | E   | 5,116,180  | 5/26/92  | Fung et al.     | 414   | 5         | 5/3/90      |
|                  | F   | 5,146,566  | 9/8/92   | Hollis, Jr.     | 395   | 275       | 05/29/91    |
|                  | G   | 5,156,363  | 10/20/92 | Cizewski et al. | 244   | 223       | 2/28/91     |
|                  | H   | 5,185,561  | 2/9/93   | Good et al.     | 318   | 432       | 7/23/91     |
|                  | I   | 5,193,963  | 3/16/93  | McAfee et al.   | 414   | 5         | 10/31/90    |
|                  | J   | 5,197,003  | 3/23/93  | Moncrief et al. | 364   | 410       | 4/7/92      |
|                  | K   | 5,203,563  | 4/20/93  | Loper, III      | 273   | 148       | 3/21/91     |

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|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   |              |                  |                          |       |           |             |    |
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|                  | P   |              |                  |                          |       |           |             |    |

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|                  | S   | Batter, et al., "Grove-1: A Computer Display to the Sense of Feel", University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA                            |
|                  | T   | Minsky, et al., "Feeling and Seeing: Issues in Force Display", Department of Computer Science, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599, 1990 ACM. |
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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Serial No.: |
|  | IMM-00607/03     | 09/638,485  |
|  | Applicant:       |             |
|  | Jacobus et al.   |             |
|  | Filing Date:     | Group:      |
|  | 8/14/00          | 2837        |

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|                  | A   | 5,223,776  | 6/29/93  | Radke et al.     | 318   | 568.1     | 12/31/90    |
|                  | B   | 5,228,356  | 7/20/93  | Chuang           | 74    | 471       | 11/25/91    |
|                  | C   | 5,264,768  | 11/23/93 | Gregory et al.   | 318   | 561       | 10/6/92     |
|                  | D   | 5,275,565  | 2/23/93  | Moncrief         | 434   | 29        | 2/23/93     |
|                  | E   | 5,381,080  | 1/10/95  | Schnell et al.   | 318   | 566       | 2/18/93     |
|                  | F   | 5,414,337  | 5/9/95   | Schuler          | 318   | 561       | 6/11/93     |
|                  | G   | 5,459,382  | 10/17/95 | Jacobus et al.   | 318   | 568.11    | 6/9/94      |
|                  | H   | 5,513,100  | 4/30/96  | Parker et al.    | 364   | 167.01    | 6/10/93     |
|                  | I   | 5,576,727  | 11/19/96 | Rosenberg et al. | 345   | 179       | 6/5/95      |
|                  | J   | 5,577,981  | 11/26/96 | Jarvik           | 482   | 4         | 8/4/95      |
|                  | K   | 5,587,937  | 12/24/96 | Massie et al.    | 364   | 578       | 4/25/95     |

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| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   |              |                  |                          |       |           |             |    |
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|                  | O   |              |                  |                          |       |           |             |    |
|                  | P   |              |                  |                          |       |           |             |    |

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|                  | S   | Rosenberg, Louis B., "Perceptual Design of a Virtual Rigid Surface Contact," Center for Design Research Stanford University, Air Force Material Command, April 1993, pp. 1-41. |
|                  | T   | Atkinson, William D. et al, "Computing with Feeling," Comput. & Graphics, Vol. 2, No. 2-E, pp. 97-103.   |
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Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Jacobus et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

### U.S. Patent Documents

| Examiner Initial | No. | Patent No. | Date     | Patentee         | Class | Sub-class | Filing Date |
|------------------|-----|------------|----------|------------------|-------|-----------|-------------|
|                  | A   | 5,589,828  | 12/31/96 | Armstrong        | 341   | 20        | 3/5/92      |
|                  | B   | 5,589,854  | 12/31/96 | Tsai             | 345   | 161       | 6/22/95     |
|                  | C   | 5,625,576  | 4/29/97  | Massie et al.    | 364   | 578       | 10/1/93     |
|                  | D   | 5,642,469  | 6/24/97  | Hannaford        | 395   | 99        | 11/3/94     |
|                  | E   | 5,643,087  | 7/1/97   | Marcus et al.    | 463   | 38        | 7/29/94     |
|                  | F   | 5,709,219  | 01/20/98 | Chen et al.      | 128   | 782       | 08/01/96    |
|                  | G   | 5,721,566  | 2/24/98  | Rosenberg et al. | 345   | 161       | 6/9/95      |
|                  | H   | 5,731,804  | 3/24/98  | Rosenberg        | 345   | 156       | 1/18/95     |
|                  | I   | 5,734,373  | 3/31/98  | Rosenberg et al. | 345   | 161       | 12/1/95     |
|                  | J   | 5,767,839  | 6/16/98  | Rosenberg        | 345   | 161       | 3/3/95      |
|                  | K   | 5,769,640  | 7/23/98  | Jacobus et al.   | 434   | 262       | 8/10/95     |

### Foreign Patent or Published Foreign Patent Application

| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
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|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   |              |                  |                          |       |           |             |    |
|                  | M   |              |                  |                          |       |           |             |    |
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|                  | P   |              |                  |                          |       |           |             |    |

### Other Documents

| Examiner Initial | No. | Author, Title, Date, Place (e.g. Journal) of Publication  |
|------------------|-----|---|
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| Examiner         |     | Date Considered   |

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

|  |                  |                  |
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|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Jacobus et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

**U.S. Patent Documents**

| Examiner Initial | No. | Patent No. | Date    | Patentee         | Class | Sub-class | Filing Date |
|------------------|-----|------------|---------|------------------|-------|-----------|-------------|
|                  | A   | 5,790,108  | 8/4/98  | Salcudean et al. | 345   | 184       | 10/23/92    |
|                  | B   | 5,889,670  | 3/30/99 | Schuler et al.   | 364   | 186       | 6/11/96     |
|                  | C   | 5,889,672  | 3/30/99 | Schuler et al.   | 364   | 188       | 6/3/98      |
|                  | D   |            |         |                  |       |           |             |
|                  | E   |            |         |                  |       |           |             |
|                  | F   |            |         |                  |       |           |             |
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**Foreign Patent or Published Foreign Patent Application**

| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
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|                  | P   |              |                  |                          |       |           |             |    |

**Other Documents**

| Examiner Initial | No. | Author, Title, Date, Place (e.g. Journal) of Publication  |
|------------------|-----|---|
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|                  | S   | Iwata, H., "Artificial Reality with Force-feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, Vol. 24, No. 4, 1990, pp. 165-170.  |
|                  | T   | Hayward, Vincent et al. "Design and Multi-Objective Optimization of a Linkage for a Haptic Interface," Advances in Robot Kinematics and Computationed Geometry, Kluwer Academic Publishers, 1994, pp. 359-368.                        |
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|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Jacobus et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

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| Examiner Initial | No. | Patent No. | Date | Patentee | Class | Sub-class | Filing Date |
|------------------|-----|------------|------|----------|-------|-----------|-------------|
|                  | A   |            |      |          |       |           |             |
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|                  | I   |            |      |          |       |           |             |
|                  | J   |            |      |          |       |           |             |
|                  | K   |            |      |          |       |           |             |

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| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
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|                  | P   |              |                  |                          |       |           |             |    |

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|  | 8/14/00          | 2837             |

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| Examiner Initial | No. | Patent No. | Date | Patentee | Class | Sub-class | Filing Date |
|------------------|-----|------------|------|----------|-------|-----------|-------------|
|                  | A   |            |      |          |       |           |             |
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|                  | D   |            |      |          |       |           |             |
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|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   |              |                  |                          |       |           |             |    |
|                  | M   |              |                  |                          |       |           |             |    |
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|                  | P   |              |                  |                          |       |           |             |    |

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|                  | S   | Jones, L.A. et al., "A Perceptual Analysis of Stiffness," Experimental Brain Research 1990, pp. 151-156.   |
|                  | T   | Kotoku, Tetsuo, "A Predictive Display with Force Feedback and its Application to Remote Manipulation System with Transmission Time Display," IEEE 1992, July 7-10, 1992, pp. 239-246.                            |
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|  | Jacobus et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

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|------------------|-----|------------|------|----------|-------|-----------|-------------|
|                  | A   |            |      |          |       |           |             |
|                  | B   |            |      |          |       |           |             |
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## Foreign Patent or Published Foreign Patent Application

| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
|                  | L   |              |                  |                          |       |           |             |    |
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|                  | P   |              |                  |                          |       |           |             |    |

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|                  | S   |  |
|                  | T   |  |
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Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

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|                  | C   | 5,209,661  | 5/93     | Hildreth et al.  | 434   | 45        | 10/29/90    |
|                  | D   | 5,220,260  | 6/15/93  | Schuler          | 318   | 561       | 10/24/91    |
|                  | E   | 5,366,376  | 11/22/94 | Copperman et al. | 434   | 69        | 5/22/92     |
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|                  | I   | 5,701,140  | 12/23/97 | Rosenberg et al. | 345   | 156       | 7/12/94     |
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|------------------|-----|--------------|------------------|--------------------------|-------|-----------|-------------|----|
|                  |     |              |                  |                          |       |           | Yes         | No |
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|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

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**Foreign Patent or Published Foreign Patent Application**

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|                  |     |              |                  |                          |       |           | Yes         | No |
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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
| Filing Date:   | Group:           |                  |
| 8/14/00  | 2837             |                  |

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**Foreign Patent or Published Foreign Patent Application**

| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
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|                  |     |              |                  |                          |       |           | Yes         | No |
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|                  | S   | Hildreth, Bruce L., Eyermann, Roger E. and Trankle, Thomas Dr., "DC Servo-Motors for High Performance High Reliability Control Loading in Flight Simulators," American Defense Preparedness Association 12 <sup>th</sup> Interservice/Industry Training System Conference, Nov. 6-8, 1990. |
|                  | T   | Baigrie, Stephen A., Reflectone Inc., "Electric Control Loading - A Low Cost, High Performance Alternative," American Defense Preparedness Association 12 <sup>th</sup> Interservice/Industry Training System Conference, Nov. 6-8, 1990.  |
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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

**U.S. Patent Documents**

| Examiner Initial | No. | Patent No. | Date | Patentee | Class | Sub-class | Filing Date |
|------------------|-----|------------|------|----------|-------|-----------|-------------|
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| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
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|                  |     |              |                  |                          |       |           | Yes         | No |
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**Other Documents**

| Examiner Initial | No. | Author, Title, Date, Place (e.g. Journal) of Publication  |
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|                  | S   | Seidensticker, Steve, "Application of Microcomputers to the Simulator 'Linkage' Problem," National Security Industrial Association 4 <sup>th</sup> Interservice/Industry Training Equipment Conference Proceedings, Nov. 16-18, 1982. |
|                  | T   | Flight Simulation, Rolfe, J.M. and Staples, K. J., eds., 1986.  |
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Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

|  |                  |                  |
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| <b>Form 1449 (Modified)</b><br><br><b>Information Disclosure<br/>Statement By Applicant</b><br><br>(Use Several Sheets if Necessary) | Atty Docket No.: | Application No.: |
|  | IMM-00607/03     | 09/638,485       |
|  | Applicant:       |                  |
|  | Schuler et al.   |                  |
|  | Filing Date:     | Group:           |
|  | 8/14/00          | 2837             |

**U.S. Patent Documents**

| Examiner Initial | No. | Patent No. | Date | Patentee | Class | Sub-class | Filing Date |
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| Examiner Initial | No. | Document No. | Publication Date | Country or Patent Office | Class | Sub-class | Translation |    |
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**Other Documents**

| Examiner Initial | No. | Author, Title, Date, Place (e.g. Journal) of Publication  |
|------------------|-----|---|
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|                  | S   |   |
|                  | T   |   |
| Examiner         |     | Date Considered   |

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